

Midterm chps 1-4 (4.5?)

Section 4.4: Adding + Subtracting  
Rationals

Recall: Adding / Subtracting fractions  
\* need common denominator

examples

$$1) \frac{3x}{5} + \frac{11x}{5} = \frac{14x}{5}$$

$$2) \frac{2x}{3} + \frac{7x}{5}$$

$$\frac{10x}{15} + \frac{21x}{15} = \frac{31x}{15}$$

Rational Expressions need common  
denominators to add / subtract

$$3) \frac{3}{8x^2} + \frac{1}{4x}$$

C.D.:  $8x^2$

$$\frac{3}{8x^2} + \frac{2x}{8x^2} = \frac{3+2x}{8x^2}$$

$$4) \frac{3n}{2n+1} - \frac{4}{n-3}$$

$$\text{c.d: } (2n+1)(n-3)$$

$$\frac{3n(n-3)}{(2n+1)(n-3)} - \frac{4(2n+1)}{(2n+1)(n-3)}$$

$$\frac{3n^2 - 9n}{(2n+1)(n-3)} - \frac{8n+4}{(2n+1)(n-3)}$$

*\* careful with subtraction*

$$\frac{3n^2 - 17n - 4}{(2n+1)(n-3)}, n \neq 3, -\frac{1}{2}$$

$$5) \frac{6}{n-3} - \frac{4}{n+2}$$

$$\frac{6(n+2)}{(n-3)(n+2)} - \frac{4(n-3)}{(n-3)(n+2)}$$

$$\frac{6n+12}{(n-3)(n+2)} - \frac{4n-12}{(n-3)(n+2)}$$

$$\frac{2n+24}{(n-3)(n+2)}, n \neq 3, -2$$

$$b) \frac{32}{x^2-16} + \frac{4}{x+4}$$

Factor first!

$$\frac{32}{(x+4)(x-4)} + \frac{4}{x+4}$$

C.D:  $(x+4)(x-4)$

$$\frac{32}{(x+4)(x-4)} + \frac{4(x-4)}{(x+4)(x-4)}$$

$$\frac{32 + 4x - 16}{(x+4)(x-4)}$$

$$\frac{4x + 16}{(x+4)(x-4)}$$

can be  
factored  
again!

$$\frac{4(x+4)}{(x+4)(x-4)} = \frac{4}{x-4}, \quad x \neq \pm 4$$